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Kadous et al.

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(54) **USER QUERIES TO MODEL ROAD NETWORK USAGE**

(56) **References Cited**

U.S. PATENT DOCUMENTS

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 134 days.

This patent is subject to a terminal disclaimer.

| | | | |
|-----------|----|---------|----------------|
| 5,005,198 | A | 4/1991 | Toda |
| 5,036,532 | A | 7/1991 | Metroka et al. |
| 5,893,081 | A | 4/1999 | Poppen |
| 6,333,703 | B1 | 12/2001 | Alewine et al. |
| 6,385,539 | B1 | 5/2002 | Wilson et al. |
| 7,221,928 | B2 | 5/2007 | Laird et al. |
| 7,536,190 | B1 | 5/2009 | Creemer |
| 7,557,730 | B2 | 7/2009 | Guezic |
| 7,701,363 | B1 | 4/2010 | Zlojutro |
| 7,912,628 | B2 | 3/2011 | Chapman et al. |
| 8,000,892 | B2 | 8/2011 | Banerjee |
| 8,099,236 | B2 | 1/2012 | Olson et al. |
| 8,103,439 | B2 | 1/2012 | Onishi et al. |
| 8,160,805 | B2 | 4/2012 | Downs et al. |

(Continued)

FOREIGN PATENT DOCUMENTS

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| | | | |
|----|-------------|---|---------|
| JP | 2005-283386 | A | 10/2005 |
| JP | 2009-109400 | A | 5/2009 |

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OTHER PUBLICATIONS

“Global Positioning System” Wikipedia, Last Modified on Mar. 28, 2011, 17 Pages, [online] [retrieved on Mar. 31, 2011] retrieved from the internet <URL:http://en.wikipedia.org/wiki/Global_Positioning_System>.

(Continued)

Related U.S. Application Data

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CPC **G01C 21/34** (2013.01); **G01C 21/3453** (2013.01); **G01C 21/367** (2013.01); **G01C 21/3667** (2013.01)

(58) **Field of Classification Search**
None

See application file for complete search history.

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(57) **ABSTRACT**

A system and method determines a plurality of scores for a road segment that are related to the total distance traveled when drivers traverse that road segment. The scores are displayed graphically to illustrate the usage of road segments. The scores are also used to determine which road segments to display on a map when determining which roads to display at a given zoom level for a map.

21 Claims, 6 Drawing Sheets

